AMENDMENTS TO THE SPECIFICATION

Please amend paragraph 5 on page 2 as follows:

The procedure for calculating the n - k parity symbols starting from the k information symbols is well known, and is a linear operation~~ (overlapping of the effects applies)~~.

Please amend paragraph 6 on page 2 as follows:

The interleaving of two linear block codes with the aim of achieving a correcting capacity higher than that of conventional linear block codes, as in so-called Product Vector Codes (PVC's), is a known procedure. The main disadvantage of PVC's consists in the ~~creation~~ limitations of the rectangular interleaver (~~since~~ in which the code words are the rows and the columns of the structure, thus in order to pass from one code to another code the interleaver writes by rows and reads by columns and *vice versa*).

Please amend paragraph 5 on page 3 as follows:

Yet another object of this invention is that of providing a method for carrying out error correction in which ~~each parity is self-protected~~ each parity is protected, thus giving rise to a completely bi-protected or even n-protected block code, in which the redundancies protect each other.

Please amend paragraph 1 on page 4 as follows:

The structure can furthermore be ~~generalized~~ generalized to cases in which there are more than two protections.

Please delete paragraph 2 on page 4.

Please amend paragraph 7, on page 4 as follows:

The present invention ~~will certainly become~~becomes clear from the following detailed description, to be read with reference to the attached figures.

Please amend paragraph 9, on page 4 as follows:

Fig. 1 shows a structure of a systematic Product Vector code with protection of the redundancies;

Please amend paragraph 2 on page 5 as follows:

Fig. 2c shows an example of a block code with mutually protected double redundancy (~~redundancy A with interleaver A is protected by redundancy B and redundancy B with interleaver B is protected by redundancy A~~interleaved redundancy A is protected by redundancy B and interleaved redundancy B is protected by redundancy A);

Please amend paragraph 3 on page 5 as follows:

Figures 3a and 3b show a possible implementation of this invention with two sets of redundancies, in which ~~one rotation is carried out on the data and one rotation on the redundancy symbols~~ rotation by one within each column is carried out on the data and on the redundancy symbols;

Please amend paragraph 1 on page 6 as follows:

One of the disadvantages of PVC's lies in the ~~creation~~ limitations of the rectangular interleaver. Furthermore, one is forced to take the product of the two lengths (*N = n1 x n2, K = k1 x k2)* as the length of the superblock. In addition, ~~in spite of these constraints, an effective supercode is in any case often not obtained~~ because of these constraints, an effective supercode is often not obtained.

Please amend paragraph 2 on page 6 as follows:

Fig. 2 shows the structure of a block code with double redundancy without protection of the redundancies. This structure provides for calculation of two sets (A and B) of redundancy symbols calculated by rows. It is, basically, ~~a PVC with the bottom right-hand corner for carrying out the cross-check missing~~ a PVC missing the bottom right-hand corner which carries the cross-check parities.

Please amend paragraph 3 on page 6 as follows:

The structure of Fig. 2a is advantageous in terms of rate (since it is not necessary to transmit the "Check on Check" parity symbols). The basic disadvantage is that while the information symbols are bi-protected, the parity/redundancy symbols are not. It is therefore sufficient for a pattern of errors that cannot be corrected to occur on the parity (on parity A for example) to make the whole block uncorrectable.

Please amend paragraph 5 on page 6 as follows:

In the case of a partially protected block code with double redundancy, the problem of the fragility of the code is partly solved: the codes have different lengths, ( ), and ~~(the only)~~ (only the) parity A is bi-protected. First of all parity A is calculated and then, after the ~~interleaving by columns, parity B is calculated~~ interleaving of parity A by columns, parity B is calculated.

Please amend paragraph 1 on page 8 as follows:

According to a possible embodiment of this invention (see Figures 3b and 3c which show two possible types of interleaving, without and with an exchange of columns respectively), the data block is interleaved by carrying out a ~~permutation within the single columns~~ permutation within each of the columns, that is to say by exchanging the positions of the elements within ~~each single column~~ each column individually. Conveniently, for the sake of simplicity of construction and description, the permutation ~~within the single columns~~ within each of the columns may consist of a rotation of the elements. The rotation is in any case a sub-class of permutations.

Please amend paragraph 5 on page 8, bridging page 9 as follows:

~~It is obvious that the~~The data block that is actually transmitted is the one shown in Fig. 3a. The block shown in Figures 3b or 3c illustrates clearly that the same data block is read in a different manner by code words. In other words, according to this invention, the code words consist of first horizontal sequences of symbols of the block [Inf + Check], for example $I1{,}1\quad I1{,}2\quad I1{,}3\quad \ldots\quad B1{,}4$ or $I6{,}1\quad I6{,}2\quad I6{,}3\quad \ldots\quad B6{,}4$ and of second horizontal sequences

of symbols of the interleaved block [Inf + Check], for example $I1,1 \quad I2,2 \quad I3,3 \quad \ldots \quad B15,4$ or $I5,1 \quad I6,2 \quad I7,3 \quad \ldots \quad B3,4$ (if Fig. 3b is considered), or $I1,1 \quad I2,2 \quad I3,3 \quad \ldots \quad A15,4$ or $I5,1 \quad I6,2 \quad I7,3 \quad \ldots \quad A3,4$ (if the same sequences are considered with reference to Fig. 3c). These same second sequences of symbols can also obviously be read in Fig. 3a by following a diagonal path and "moving upwards" in the column subsequent to the one of the element at the lower end of the diagonal itself.

Please amend paragraph 1 on page 9 as follows:

~~The code words are paths. A "path" is therefore understood to be a sequence of positions of symbols.~~The code word symbols occupy a sequence of positions herein referred to as a "path". Path "i" is given by the sequence $row \quad f(i,j)$, $column \quad j$, with $j = 1,2,3,\ldots n$. Each of the h rows is a code word having a length n and a redundancy $(n-k)/2$; each of the h paths is also a code word having a length n and a redundancy $(n-k)/2$.

Please amend paragraph 2 on page 9 as follows:

The interleaver according to this invention defines the permutations (which can, in particular, be rotations) and it therefore defines the path trajectories. Clearly, the function $f(\cdot)$ defines the structure of the interleaver. For example, paths along the diagonals are obtained with the following formula:

$$f(i,j) = (i-1+j-1)MODh \; +1$$

with $j = 1,2,3...n$ and $i = 1,2,3,...h$

Please amend paragraph 3 on page 9 as follows:

It will therefore be understood that this "super code" is systematic (it lets the $k.h$ information symbols ~~to~~ pass through unaltered and simply adds the $(n-k) \cdot h$ parity symbols.

Please amend paragraph 4 on page 9, bridging page 10 as follows:

This invention, advantageously, achieves the object of ~~equalising~~ equalizing the robustness of all the symbols of the code so that there are no areas more fragile than others, by introducing the use of the rotating interleaver. The sequence of rotations is, theoretically, generic, provided it keeps the number of intersections to a minimum. It is reiterated that, as a ~~generalisation~~generalization, the rotations are in fact generic permutations.

Please amend paragraph 1 on page 10 as follows:

~~If we consider two parities (parity A and parity B), the two parities are constructed~~The two parities (parity A and parity B) are constructed in such a way that they can protect each other. In the example, the parities are of the same size, although it is possible to have parities of different sizes. Parity B is calculated by rows, having as its input one row of information symbols and one de-interleaved row of Parity A (Fig. 3a). *Vice versa*, in Fig. 3c, parity A is also calculated by rows, but having as the input one interleaved row of information symbols and one row of interleaved Parity B. It must be noted that the permutation on columns has been carried

out only on the parity and not on the data. As will be seen, to obtain this loop, it is necessary to solve a linear system.

Please amend paragraph 3 on page 10 as follows:

It must be noted that the process can be extended to more than two concatenated codes, three for example (using two different interleavers simultaneously). Again in this case, for practical reasons only, redundancies A, B, C have the same lengths. This situation is illustrated schematically in Figures ~~4a, 4b e 4c~~ 4a, 4b and 4c.

Please amend paragraph 2 on page 11 as follows:

Since the code is linear, we exploit this linearity, that is to say we apply the ~~overlapping of effects~~additive property of the code words. The second group of columns of parities is given by the contribution of the data parities ($P1$ if the parity is per rows or $P2$ if the parity is per paths) plus the contribution of the parities of the first group of columns Y (AY if the parity is per rows or BY if the parity is per paths). The A and B matrixes depend on the code and on the interleaver and can be calculated by means of known techniques.